MACHINE LEVEL CONTROL RECORD

MACHINE TYPE _DCS_ SERIAL No. _10618_ SUFFIX LEVEL _____ E/C _415447_

B/M No.	E/C No.	D/A No.	DESCRIPTION	INSTALLED DATE	INITIAL
2166560	415352		Ins. SLT Panel Rework	11-1	PEH
2166561	415368		Ins. Functional Interlock Changes	11-1	"
2166562	415372		Ins. SLT Panel Rework	12-2	"
2166565	415374		Ins. Power Sequence Improvements	12-3	"
2167003	415388		Ins. Gate Asm. Revision	12-3	"
2166567	415408		Ins. Improved Read Amp. & Access Card	12-29	"
2166568	415419		Ins. Transducer Rewiring	12-29	"
2167006	415407A		Replace Head Load Springs	12-29	"
2167007	415335A		Replace Preload Bearing	12-29	"
2167009	415398		Remove Interlock Handle Spring	1-11	"
2166565	415374A		Correct Errors in EC 415374	3-9	"
2166569	415416		Replace ALDs & Supply 48v Terminal	3-9	"
2167011	415393		Ins. Filter Asm.	4-5	"
2167008	415423		Ins. Head Load Plug Retainer	4-5	"
2167005	415386		Ins. Transducer Locking Block	4-6	"
2166570	415433		Ins. Tachometer Capacitor	5-27	"
2166570	415433B		Ins. SLT Panel Rework (Corrects 415433)	7-14	"
2166572	415444		Ins. Access Logic SLT Card	7-14	"
2167024	415477		Replace Door Opener	7-22	"
2167102	421001A		Replace Defective Spindle	7-22	"
2166573	415447		Ins. Interlock Compatibility	8-5	"
2167027	421102A		Replace Disk Guide	8-10	"
2167028	415379C		Replace Card Retainer	9-26	"
RFA-1316787			Update SLT Board	10-8	"
	421029		new K? card	6-6-?	RS
2251960	420400		DET ADI File.	1-10-8	b.n.
2166868	420114	on EC 415-738	New Head Clamp.	1-10-9	b.n.
2251947	421043		Cartridge light Improvement.	1-10-9	b.n.
2251958	421047		CE Head Load.	1-10-8	b.n.
2251990	421057		capacitor	7-9-9	RS
	421063		1061CS	12-11-8	GC

ANY SIGNIFICANT REPLACEMENT OR REMOVAL SHOULD BE NOTED AND DATED.

IBM

FIELD ENGINEERING

INSTALLATION INSTRUCTIONS

MACHINE TYPE ___DISK CARTRIDGE STORAGE___

ENGINEERING CHANGE HISTORY			
E / C NO.	DATE	SHEET	NO.
415416	12/30/65		
415438	23MAR66	1-4	

23 HOLE PUNCH FOR INSTALLATION BINDER

UNIT INSTALLATION INSTRUCTIONS

IBM DISK CARTRIDGE STORAGE

ENG. DATE	12/30/65	23MAR66				
CHANGE NO.	415416	415438				

NOTE: Do the following steps in the sequence given unless otherwise noted. For adjustment procedures consult the F.E. Maintenance Manual.

A. Unpacking

1. Remove packing. Check machines for possible shipping damage.

2. Inventory the parts in the CPU shipping group.

3. Remove shipping braces, etc.

B. Baseplate Grounding Check

1. Remove ground wire at voice coil.

2. Remove wire from DC terminal 1-4 or 5-4 (machines prior to Serial #00050) and frame ground.

3. Measure resistance between the base of the file and the CPU or frame. The reading should be 5 megohms or higher.

   (The baseplate is the large aluminum casting on which the access mechanism is mounted. It is normally grounded at the point only by means of a lead connected to the gate DC terminal.)

4. Replace wires to connector when finished with measurement.

5. If no extra grounds exist, continue.

6. Repeat item B for each module.

C. Cabling to CPU or FCU

1. Remove all AC power to CPU/FCU.

2. Install AC cable between CPU/FCU and file #1. Plugging one end into the FCU AC plug provided and connect the other end to AC terminal block TB-4 (AC box) or TB7 on machines prior to Serial #00050.

3. Install DC cable between CPU/FCU. Connect to TB1 or TB5 (for machines prior to serial #00050).

D. Mechanical Checks

1. Check head load springs for proper seating against R/W heads. Check that arm clamps are snug.

2. Check the R/W head plugs for no loose connectors.

3. Check transducers for no loose connectors.

4. Check terminal voice coil and tachometer for no loose terminals or shorts.

5. Check motor drive belt for proper tension and tracking.

ENG. DATE	12/30/65	23MAR66				
CHANGE NO.	415416	415438				

6. Check that SLT cards and paddle cards are securely plugged in the gate.

7. Repeat steps D1 - D6 for all disk storage drives being installed.

E. Power Check (Disk Pack Off)

1. Check voltage and cycles on all file units being installed to insure they match the CPU or FCU.

2. Check the following voltages with AC power on FCU or CPU. Adjust if necessary.

Voltage	TB1/TB5 Terminal No.	Tolerance	Source
+48	5	± 8%	FCU/CPU
+ 6	3	± 4%	" "
+ 3	1	± 4%	" "
- 3	2	± 4%	" "

3. Check the operation of all fans.

4. Repeat steps E2 and E3 on all files being installed.

F. Head-Disk Check (Power Off)

1. Inspect CE disk cartridge for shipping damage.

2. Vacuum entire base plate and clean.

3. Check R/W heads for damage.

4. Check adjustment of the head unload mechanism; see F.E. Maintenance Manual.

5. Mount CE disk cartridge

6. WARNING: Do not let heads load during this step. Carefully move carriage forward into disk cartridge.

7. Check closely for interference between heads, head cables, and disks. Move the carriage all the way to positive stop.

8. Restore the carriage to the fully retracted position.

9. Check for proper clearance of the index transducer to the slotted bottom disk by rotating disk.

10. Repeat steps F2-F9 on all files being installed.

ENG. DATE	12/30/65	23MAR66				
CHANGE NO.	415416	415438				

G. File motor and head loading check

    1. Mount CE disk cartridge and turn on the motor Start/Stop switch.

    2. Check the following items:

       a. Pack motor starts.

       b. When heads are loaded use flashlight to check that head cables, etc., are clear of disks. Note: Head load delay circuit approx 90 sec.

       c. Carriage is detented at track 000.

       d. Ready light is on. (in CPU)

H. Head Unloading Check

    1. While watching the heads on the DCS, turn the file off. The heads should unload immediately.

    2. If the heads do not unload at once, before the disks slow down appreciably, determine and eliminate the cause of this failure before proceeding, then power back up and repeat step 1 above.

    3. Repeat Sections G and H above on all files being installed.

    4. With all file motors on, turn system power off. All motors should turn off, all heads should unload.

I. Head Alignment Check

    Notice: All heads must be checked at installation to insure interchangeability of disk packs. Refer to F.E. Maintenance Manual for procedure.

    (Note: Set scope and heads as if to align heads. Allow 30 minutes warm up time. Heads can be checked by applying slight pressure on carriage in both directions and viewing the scope output. The amplitude must not vary more than 25% of the optimum level. see figure in CE Maintenance Manual).

J. General Checks:

    Run diagnostics to check the operation of files, FCU and meters.

ENG. DATE	12/30/65	23MAR66				
CHANGE NO.	415416	415438				

DATE	EC NUMBER	DATE	EC NUMBER	INDEX PAGE		
SEE INDEX CARD		NOV 67	421047			
DEC 66	421025	15 JUL 68	421057	DATE	SEP 65	P/N	2199571
JAN 67	421029	NOV 68	421063			TYPE	13SD
FEB 67	421032			IBM		XA000
AUG 67	421043					

XA000

```
A2      CONNECTOR                 XA012 A1 A2 A3 A4 A5 A6    K4      CONNECTOR                                                           PLUG LIST
        B02  XA101AA2                   AB A9 AA AB AC AD            A04  XA031AB2
        B03  XA021AT4                   AE AF AG AH AL              A06  XA031AB1           PART NO ACC TYPE SOCKETS  TOTAL
        B04  XA061AB1             XA013 AN AP AQ AR AS AT    ******************************   5800764      0764 H2              01
        B05  XA011AT2             XA012 AU                  L2      SINGLE CARD              5803758 2310 3758 B2              01
        B07  XA031AW1             XA013 AW                          5815                     5803780 SDS  3780 H3              01
        B08  XA011AF2             XA021 AX                                                   5804613      4613 M2              01
        B09  XA021AL4             XA013 AY                          XA011 A2                 5804673      4673 N2              01
        B10  XA061AE3             XA012 AZ B1                        XA052 B1                5804679      4679 E2              01
        B12  XA051AG4                                               XA011 B3                5806298      6298 D2              01
        B13  XA061AE4     E4      CONNECTOR                 ******************************   5807198      7198 F2              01
        D02  XA021AS4             A04  XA011AV4             M2      DOUBLE CARD              5807234      7234 G2              01
        D04  XA031BN4             A06  XA011AV4             M3      5804613 4613             5807235      7235 J2              01
        D05  XA011AS2             D04  XA051AA3                                              5807319 SDS  7319 C2              01
        D06  XA051AH4             D06  XA051AA7             XA042 A1 A2 A3 A4                5807511      7511 K2              01
        D07  XA061AE6     ******************************    XA052 B1                                      5815 L2              01
        D09  XA061AE7     F2      DOUBLE CARD               ******************************               CONN A2 A3 B4 C4     11
        D10  XA061AE8     F3      5807198 7198              N2      DOUBLE CARD                                 D4 E4 F4 G4
        D11  XA061AE9                                       N3      5804673 4673                                H4 J4 K4
        D12  XA101AA6     XA041 A1 A2 A3 A4 A5 A6
        D13  XA052BK4           A7 A8 A9 AA AB AC           XA042 A1 A2 A3 A5 A6 A7
                                 AD AE AF AG AH AJ                AB A9 AA AB
A3      CONNECTOR                AK                          XA031 AC
        B02  XA062AY4                                        XA042 AD AE AF AG
        B04  XA061AB1     F4      CONNECTOR                 ******************************
        B05  XA061AD2             A04  XA011AV4
        B07  XA062AL4     ******************************
        B08  XA011AF2     F2      DOUBLE CARD
        B09  XA061AD3     F3      5807234 7234
        B10  XA061AB3
        B12  XA051AG4     XA031 A1 A2 A3 A5 A6 A7
        B13  XA061AB4           A9 AB AC AD AE AF
        D02  XA101AA6           AG AH AJ AK AN AP
        D04  XA061AD6           AQ AY
        D06  XA062AJ4
        D07  XA061AE6     UNUSED PORTIONS
        D09  XA061AB7
        D10  XA061AE8           B
        D11  XA061AE9
        D12  XA062AK4     G4      CONNECTOR
        D13  XA052BK4             E04  XA012AB2
******************************       E06  XA011AU4
B2      SINGLE CARD    2310 ******************************
        5803758 3758  H2      SINGLE CARD
                                5800764 0764
XA062 A1 A4 B1 B4 C1 C4
      D1 D2 E1 E2 E3 E4  XA011 A1 A2 A7 A8 A9 AA
      F1 F2 F3 F4 G1 G2        AB AC
      G3 G4
                        H3      SINGLE CARD        SDS
UNUSED PORTIONS                 5803780 3780

      H                 XA011 A1 A2 A3 A4

B4      CONNECTOR         H4      CONNECTOR
        A06  XA042AC4             A06  XA011AU4
        B04  XA101AA3             B04  XA031AB2
        B06  XA041AK4             B06  XA011AU4
        C04  XA011AV4             C04  XA041AA2
        C06  XA041AE2             C06  XA052BX2
        D04  XA041AE4             D04  XA101AA2
        E04  XA041AK2             E04  XA101AA3
        E06  XA052BT2             E06  XA011AV4
******************************  ******************************
C2      DOUBLE CARD     SDS J2      DOUBLE CARD
C3      5807319 7319    J3      5807235 7235

XA021 A1 A2 A3 A4 A5 A6   XA051 02 05 06 07 09 14
      A7 A8 A9 AA                15
                           XA052 17 18
UNUSED PORTIONS           XA051 20 21
                           XA052 22 23 25 26 27 29
      B C D                      30
                           XA051 31
C4      CONNECTOR         XA052 32 33
        A06  XA101AA6     XA051 34
        B04  XA052BX2     XA052 AC
        B06  XA052BE4     XA051 B1 C1 D1 D2 D3 D4
        C04  XA042AA4
        C06  XA042AC4
        D04  XA101AA5     J4      CONNECTOR
        F04  XA101AA2             A06  XA031AZ3
        E06  XA011AV4             B04  XA031AY7
******************************       B06  XA042AA4
D2      DOUBLE CARD               C04  XA031AX7
D3      5806298 6298              C06  XA031AX7
                                  D04  XA012AB2
XA011 A1                          D06  XA061AB6
XA021 A2 A3 A4 A5 A6 A7           E04  XA041AA2
                                  E06  XA031AE4
                           ******************************
D4      CONNECTOR         K2      DOUBLE CARD
        A04  XA041AW2     K3      5807511 7511
X       A06  XA041AW5
A       E04  XA011AV4     XA051 A1 A2 A3 A4 A5 A6
0       E06  XA051AB1           A7 A8
0******************************
1E2     DOUBLE CARD       UNUSED PORTIONS
E3      5804679 4679            B C
```

HEAD 0
AA
AR XD02
S165G
X-A1H2KD06

-OX.75X WRITE SELECT HEAD 0——XA012AV4————————D13

-OX1.5X READ SELECT HEAD 0——XA012AU4

-OX1.5X READ SELECT HEAD 1——XA012AT4

2 HDS SELECTED
AB
A
S03SOU B04
X-A1H2
D06
B04
DC5

DETECTOR
AD
N
S10SUL D07
X-A1H2J

HEAD 1
AC
AR KD02
S165G
X-A1H2KD05

-OX.75X WRITE SELECT HEAD 1——XA012AS4————————B02

AU
SERV*
+6V B11*
X-A1H3
——XA012 + 6V XA031 XA041————————AU4

AV
SERV*
DC GND D08*
X-A1E3
——XA051 DC GND XA101————————AV4

WRITE ERROR
AE
B10 OR
D07
D10 J L B12
X-A1H2

LATCH
AF
B13 A DB10*
B12 J L
X-A1H2
——XA052 — WRITE SELECT ERROR————AF2

——XA012 + WRITE LOCK————————AE4

825 TO + 35V
AP
R
G07 —825
X-A1L2

WR CURRENT DET
AH
SPEC B07
D02 T40SRL
X-A1H2

ON DLY 50 US
AG
B07 A
G LD D10
D11 X-A1H2

— NOT WRITE GATE————XA012AH4————————D11

— WRITE LOCK RESET————XA051AP4

35 VOLT REG
AU B09
+ 48V————XA042AA4——D02X SPEC*
TB13
TB08
KB05
S255P
X-A1L2KD09

+ 6V ZENER
CB
SPEC*
6298A1
S60SF
X-A1D2
BC9 +35V
BC9

CA
SERV*
BC9 +35V
X-A1D2

CC
SERV*
B09 +35V
X-A1E2

CD
SERV*
B09 +35V
X-A1H2

CE
SERV*
B09 +35V
X-A1J2

CF
SERV*
B09 +35V
X-A1K2

——XA012 1.44 MHZ OR DF WR DATA TERMTD——CG4

— CPU CLOCK GATE————XA061ABB*

1.44 MC
AQ
OSC * B04
SDS WL
3780A1
T22SD
X-A1H3
B07

720KC CNT DN
AR
FF *DB10
SDS
B04 3780A2 D06
B07 T20SE
X-A1H3

AS
N * B02*
SDS
B10 3780A3
T10SL
X-A1H3
——XA061 700KC PHASE A————————AS2

CG
OR *
DOT

AT
N *D02*
SDS
D06 3780A4
T10SL
X-A1H3
——XA061 700KC PHASE B————————AT2

D. F. WRITE DATA TERMINATED——XA062AU4

000 XA012

180 TO - 3V
AA
R *
B03
T61SM
X-A1E2

- HEAD 1 SELECT + HEAD 0 ——XA061AB7*

HEAD SEL
AB
SW * NO *

NOTE 1
BA
R-10K*

+ 6V————XA011AU4

- CPU CLOCK GATE————XA061AB8

+ CE INTERLOCK————XA061AB6*

AM
B13 OR
B10 J L D02
X-A1E2

AR
N *
D02 D02 D12
TO3TM
X-A1E2

AN
N
D04 J L J07
X-A1E2

AC
B04 OR
B03 J L D05
X-A1E2

D02
J07
J11
AS
A
J L G02
X-A1E2
——XA011 -OX.75X WRITE SELECT HEAD 1——AS4

D02
D05
AT
+35V AND
A *
G07
TO3TK
X-A1E2
——XA011 -OX1.5X READ SELECT HEAD 1——AT4
XA013

D12
D05
AU
+35V AND
A *
J09
TO3TK
X-A1E2
——XA011 -OX1.5X READ SELECT HEAD 0——AU4
XA013

——XA011 - NOT WRITE GATE——AH4

J11
J07
D12
AV
A
J L B12
X-A1E2
——XA011 -OX.75X WRITE SELECT HEAD 0——AV4

AH
N
B02 J L J11
X-A1E2

AJ
B02 OR *
B05 J L D06
TO3TL
X-A1E2

2K TO +6V
AP
R *
D06 D06
T61ST
X-A1E2

+ WRITE LOCK————XA011AE4

- CPU WRITE GATE————XA061AB9*

430 TO +6V
AD
R *
B07
T61SO
X-A1E2

.001 UF TO GND
AE
CAP *
D13
T61SP
X-A1E2

NOT WR CLAMP
AW
SPEC*KG04
D06
X-A1E2KG05

——XA013 O CLAMP WRITE TRIGGER——AQ2

——XA013 .75 CLAMP WRITE TRIGGER——AQ6

- WRITE DATA GATE————XA061AB4*

AF
B07 A *
B08NT32SC J04
X-A1E2

AK
J04 A *
B02 T20SG
X-A1E2

1.44 MHZ OR DF WR DATA TERMTD——XA011CG4

AG
B07 A *
B08NT32SC J06
X-A1E2

AL
J06 A *
T20SG
X-A1E2

WRITE TRIGGER
AQ
FF * G04
T20SH
X-A1E2 G05

NOTE 1. RESISTOR
LOCATED ON PADDLE
X CARD OF CABLE IN
A POS T7. SEE XA081.
0
1
2

000

XA061AB4   01X-A1A3D09
01X-A1A2B13 XA061AB9
01X-A1A3B13 01X-A1A2D11
XA061AB6   01X-A1A3D11
01X-A1A2D07 AB2 X-A1J4D04
01X-A1A3D07 01X-A1G4E04
01X-A1J4C06
XA061AB7
01X-A1A2D09

LOC. TYPE
X-A1E2 4679

WRITE TRIGGER AND SELECT		
E.C. HISTORY	MACH. 13SD	X A 0 1 2
415412D 415433		
415411V 415433B	FRAME 01	
415352 415444		
415374A 421032	IBM CORP. SDD	
DATE LAST EC		000
12-12-67 421047	P.N. 2199564	

HEAD DRIVER
AA
AR ※
G05 S15SV ▷J10
X-A1E2

75 CLAMP WRITE TRIGGER————XA012AQ6————

SELECT MATRIX
AD
SPEC※▷G13
J10▷
X-A1E2▷G12

SELECT MATRIX
AH
OR
G13▷
S03SO ▷
G12▷X-A1E2

READ WR HEAD
AF
HEAD※K
1
K

OX1.5X READ SELECT HEAD 1————XA012AT4————

CLAMP + 35V
AB
SPEC※KJ10
S61XX
X-A1E2KJ02

SELECT DIODE
AK
SPEC※K
B02
X-A1E2K

XA021 HEAD READ SIGNAL————AH4

READ WR HEAD
AG
HEAD※K
0
K

OX1.5X READ SELECT HEAD 0————XA012AU4————

XA021 HEAD READ SIGNAL————AJ4

HEAD DRIVER
AC
AR ※
G04 S15SV ▷J02
X-A1E2

O CLAMP WRITE TRIGGER————XA012AQ2————

SELECT MATRIX
AE
SPEC※▷J12
J02▷
X-A1E2▷J13

SELECT MATRIX
AJ
OR
J12▷
S03SO ▷
J13▷X-A1E2

CPU WRITE GATE————XA061AB9————

LOC. TYPE
X-A1E2 4679

WRITE DRIVER AND HEADS		
E.C.HISTORY	MACH.13SD	
415412D 415433B	FRAME 01	
415411V 415444		
415374A		
415433	IBM CORP. 5UU	
DATE LAST EC	P.N. 2199563	
11-13-67 421047		

XA013 000

+ HOME DRIVE —— XA051AY4 —— D07

+ HEAD LOAD SWITCH —— XA052BG4 —— B13

AA
A *
D04
T32SF
X-A1G2 — D10

AL
OR
D10
D11
B03 X-A1G2
J
U

B12

AQ
B07
G05
A
B12
J — J10 —— XA041 — ACCESS REVERSE —— AQ4

AR
CR
D13
T61CF
X-A1G2
D10
D11

AT
G05
B07
A
J — J12 —— XA041 — ACCESS FORWARD —— AT4

— CPU DIRECTION REV + FWD —— XA061AB1*

STEP DIRECTION
AE
SW *
C CE PNL NC *

+ CE INTERLOCK —— XA061AB6

750 OHM TO +3V
BG
R *
S61AA
X-A1

2.6 MS NOTE 2
AU G05
SS *
T21TV
X-A1G2
B07

DET SQUELCH
G05 AZ
AR *
B09*
T15SD
X-A1G2

AK
B12
A
▷○
H
▷ — J13
D12 X-A1G2

+ HOME —— XA051BB2

STEP CONTROL
AB NO *
SW * NO *
C CE PNL

DIFF
AF
SPEC*
G12
T61SS
X-A1G2

BC
R *
D05
S61TO
X-A1N2

—— XA101 +24X0X DETENT HOLD —— AZ3

—0X1X GO LATCH RESET —— XA041AX4

NOTE 1
BM
R-10K*
K

BD
N
J06 J U G08
X-A1G2

+ AND
AH
D04
CS *
WL
G08 T32SH ▷ G03
X-A1G2

+ 6V —— XA011AU4

—— + ACCESS READY —— AW1
XA061 XA062

+ 48V —— XA042AA4

— ACCESS GO —— XA061AB5

— ACCESS GO TERMINATED —— XA062AE4

BN
OR *
DOT

AX
D06
A *
J13
K
D02X
T32SI
X-A1G2 B04*

—— XA101 —0X48X ODD DETENT —— AX7

GO LATCH
AJ
B07
D04
A
B13
J — D06
X-A1G2

GO LATCH
AM
D10
OR
D06 J U B07
G03 X-A1G2

10 MS NOTE 2
AU D04
SS *TG02
T21TD
X-A1G2 KG09

62 OHM TO +3V
BE
R *
S61UL
X-A1G2

DETENT TRIGGER
BJ
FF * J13
WL
B08N
T20SF J11
X-A1G2

— DETENT TRIGGER —— XA041AP2

BP
OR
DOT

AY
D06
A *
J11
D02X
T32SI
X-A1G2 J02*

—— XA101 —0X48X EVEN DETENT —— AY7

MINUS AND
A *| D07
7198AK
T03TH
X-A1F2

XA031 - DETENT TRIGGER —————— 4P2

- 10 FIL STEP + 20 MIL ——— XA061AB3* J06 AB OR *
J07 7198AFD T03TI
X-A1F2

STEP MODE
EM * NO *
CE PNL

+ CE INTERLOCK ——— XA061AB6 C

LEVEL SET
AR * B05
7198AJ
T10SP
X-A1F2

LEVEL DET
SPEC*
B05 D05 7198AB S40TG KB13
X-A1F2

AX
N *
G03 7198AB J11 XA031 -0X1X GO LATCH RESET ——— AX4
S10SK
X-A1F2

- ACCESS REVERSE ——— XA031AQ4 G13 AC OR
G12 J X-A1F2

INTGRTR RESET
AG
N * B13
7198AE
S10SR
X-A1F2

NOTE 1
BP
R-10K*

+ 6V ——— XA011AU4 K

AH
N *
WL
J12 7198A3 G04
S05SF
X-A1F2

AD
N *
G13 7198A1 J12
S10SL
X-A1F2

AJ
N *
J12 7198A4 G08
S10SM
X-A1F2

-3 LOSS PROTEK
AR
SPEC*
WL
7198AG G04
S40UH
X-A1F2

BR
OR *
DOT

-0X5X BRIDGE CURRENT FEEDBACK ——— XA042AE5

- ACCESS FORWARD ——— XA031AT4

BQ
SERV*

+48V ——— XA042AA4 D02 +48V
X-A1F2

TACH BALANCE
AE
SPEC* D09
7198AA D10
S40TF D05
X-A1F2

OWN
TACH* RED*
XA101
BLK*
VIO

TACH AMP
AS B12
SPEC* B04
WL D06
D11
G04
KG09
S40TH
X-A1F2 B08

INT CHG
AV
SPEC*
7198A9 KB13
S60SE
D06 X-A1F2

B09 B04
J13 B12
B10 D11
G08

EM FOL
AW
AR * J04*
G04 J02
J10
B08 7198AC G10*
S11SA
X-A1F2

XA042 +48X0X VOICE COIL B ——— AW2
XA042 -2X6X B DRIVE ——— AW3
XA042 -2X6X A DRIVE ——— AW4
XA042 +48X0X VOICE COIL A ——— AW5

AF
N *
G12 7198A2 G07
S10SL
X-A1F2

AL
N *
G07 7198A5 J13
S10SM
X-A1F2

-3 LOSS PROTEK
AN
SPEC*
WL
7198AH B08
S40UH
X-A1F2

BS
OR *
DOT

AM
N *
WL
G07 7198A6 B08
S05SF
X-A1F2

LOC. TYPE
X-A1F2 7198

AB
SERV*
-3 V   G06 —— G06
X-A1N2

AZ
SERV*
-3 V
X-A1N2

AA
SERV*
48 V   D02*◇——— + 48V ————————————AA4
X-A1N2   └XA011 └XA031 └XA041 └XA052
         └XA101

510 OHM TO -3V
AD
R *
-2X6X A DRIVE———XA041AW4—◇B06 S61TV
X-A1N2

~~ OHM TO +48V
AP
R *   G03
S61TN
X-A1N2

BRIDGE TR NPN
AE
AR *KD02
S15SY B03
X-A1M2

.1 UF
AL
C
G03 -.1UF KJ13◇———J13
X-A1N2

220 OHM
AQ
R *
S61TM G03
X-A1N2

BRIDGE TR PNP
AV
AR *KD02
B07 S15SX G05
X-A1M2

CLAMP TO +48V
CR
KB03◇———B03
S61TQ
X-A1N2

CLAMP TO GND
CU
CR *
S61TQ
X-A1N2

+48XOX VOICE COIL A———XA041AW5—◇

VOICE
BA
COIL*

A

1 OHM TO 48V
AY
R *
B10 S61TS
X-A1N2

+48XOX VOICE COIL B———XA041AW2—◇

B

BRIDGE TR NPN
AF
AR *KJ13
-2X6X B DRIVE———XA041AW3—◇G10 S15SY KB03
X-A1M2

.1 UF
AM
C
B12 -.1UF KB03◇
X-A1N2

220 OHM
AT
R *
S61TM B12
X-A1N2

BRIDGE TR PNP
AW
AR *KJ13
G09 S15SX KG05
X-A1M2

CLAMP TO +48V
AS
CR *
KJ13◇ J13
S61TQ
X-A1N2

CLAMP TO GND
AK
CR *
S61TQ
X-A1N2

XA041 -0X5X BRIDGE CURRENT FEEDBACK—AE5

510 OHM TO -3V
AG
R *
B05 S61TV
X-A1N2

2 OHM TO GND
AH
R *
D04 S61TP
X-A1N2

62 OHM TO +48V
AU
R *
B12 S61TN
X-A1N2

AC
SERV*
48 V
GND   D03*◇——— + 48V GND ————————AC4
X-A1N2 └XA052 └XA101

LOC. TYPE
X-A1M2 4613
X-A1N2 4673

AA4 X-A1C4C04
01X-A1J4B06
AC4 X-A1C4C06
01X-A1

VOICE COIL BRIDGE

E.C.—HISTORY——— MACH.13SD
415412D 415374A
415411V 415433   FRAME   01
415352   415433B
415374   415444   IBM CORP. SDD
DATE   LAST EC
12-15-67 421047   P.N. 2199565

X
A
0
4
2

000

000 XA051

SECT TRANS
AAK 2
COIL*
1
6 *
4
K 5
3 *

LIN AMP
G09   AB J09*
G13   SPEC*TJ13
G02K   KJ06
B12T   TJ10
G07K   KG08
J12T
G03KS40TY
J11TX-A1K2

DETECTOR
AC
SPEC*
J07   J09
S25SQ
X-A1K2

165 US
AD B08   B08 AE
SS *TB07   N *
TD06
KJ04
S10SQ
TJ05   X-A1K2
S21SF KD13
X-A1K2KD09
J07P   J07P   D10   D10P

890 US
AF D12   D12 AG
SS *TB05   B08 A
B03
KD04
TD05   J   LD B04*   XA061 - REFERENCE PULSE   AG4
S21SG KB10
X-A1K2KD11

B08 AH
A
B03   J   LD D07*   XA061 - SECTOR PULSE   AH4
X-A1K2   XA062

DC GND   XA011AV4

EM FOL
AK   AJ   AR *
N
B03 J LD G04   G12   NOTE 1   J02
X-A1K2   S60SQ
X-A1J2

INTEGRATOR
AL
AR *
J02   J13
J10   S60SQ   G09
X-A1J2KG03

LEVEL DETECTOR
AM
SPEC*
J13   S40TZ   J04
X-A1J2KJ06

NOTE 3
AN
N *
II   AP
X-A1J2   N
B03
X-A1J2

+ MOTOR ON SIGNAL   XA052AJ4   XA052 INTEGRATOR LEVEL   AN4

AQ
A *
B05
TO3TT
X-A1J2

- WRITE LOCK RESET   AP4
XA011   XA052

XA052 - 70 PERCENT LATCH SET   AW4

RAMP GENERATOR
AR   AS   AT   AU
Z *   SPEC*   CV *   N *
J02   70 PERCENT   LATCH
AV   AW
J09 OR   B03
S60SI TD12   D12 NPN254   D13   D13   PNP101   J05   J05 J   J LD D09
X-A1J2   X-A1J2   X-A1J2   II   X-A1J2   X-A1J2
X-A1J2

FILTER
BB
N *   B04   + HOME   BB2
G02   XA031   XA052
T10ST
X-A1J2

- FILE READY   XA052BK4

B08 AY
A
J   L B12   XA031 + HOME DRIVE   AY4
G02 X-A1J2

FILTER
BD
N *   XA052 - HEAD LOAD SWITCH   BD2
G05
T10ST
X-A1J2

+ HEAD LOAD SWITCH   XA101AA3*
- HOME SWITCH   XA101AA2*

FILTER
BF
Z *
G13   XA052 - 90 SECOND TIME DELAY   BF4
S60SJ
X-A1J2

- 90 SECOND TIME DELAY RELAY   XA101AA6*

NOTE 1. PART OF S60SQ
NOTE 2. BLOCKS D1 TO D4
ARE CKT FLYER S60SI
NOTE 3. PART OF BLOCK AM
CKT FLYER S40TZ

XA101AA2   01X-A1A3D02
01X-A1C4E04   01X-A1A2D12
01X-A1A2B02 AA3 X-A1E4D04
01X-A1H4D04 AA7 X-A1E4D06
XA101AA3   AB1 X-A1D4E06
01X-A1H4E04 AG4 X-A1A2B12
01X-A1B4B04   01X-A1A3B12
XA101AA6   AH4 X-A1A2D06
01X-A1C4A06

LOC. TYPE
X-A1J2 7235
X-A1K2 7511

TRANSDUCER INTERLOCK
E.C.HISTORY   MACH.13SD
415419   415447
415433   421019   FRAME   01
415433B   421029
415444   421032   IBM CORP. SDD
DATE   LAST EC
12-15-67 421047   P.N. 2199525

- WRITE SELECT ERROR————XA011AF2

G04
D09
D11
B03

BK
A
J LD B08*
X—A1J2

— FILE READY ————————BK4
XA051 XA061

40 MS
AZ
TO *

BG
N
L D11

T45SA
X—A1J2KD11

XA031 + HEAD LOAD SWITCH————BG4

HEAD HOLD
BT
AR *LD B10*

BL
A
J B03
X—A1J2

723533 TD10
S07TG
X—A1J2KG08

XA101 —0X48X HEAD HOLD————BT2

XA051 + MOTOR ON SIGNAL————AJ4

AX
N
X—A1J2

BE
N *
723532 LD D06*
S10SJ
X—A1J2

XA101 —0X48X CARTRIDGE UNLOCK SOL——BE4

— HEAD LOAD SWITCH————XA051BD2
— 70 PERCENT LATCH SET————XA051AW4
— WRITE LOCK RESET————XA051AP4

— DRIVE MOTOR ON————XA101AA5*

CART. UNLOCK
AP
N *
B02
B04
J
X—A1J2

+ HOME————XA051B52
INTEGRATOR LEVEL————XA051AN4

AJ
N *
B02 D 7235AC
T10ST
X—A1J2

300 OHMS TO +6
CA
R *
G07 723527
S61TR
X—A1J2

— 90 SECOND TIME DELAY————XA051BF4

BH
A
J U
B03   G07
J09 X—A1J2

NOTE
BG
AR *
GD2
5815B1
S11SB
D02 XX—A1L2 G03

POWER TR
BX
AR *LD D13*   — XA101 —0X48X HEAD PICK————BX2
B10 461381
S15SY KG07
X—A1M2

+ 48V GND————XA042AC4
+ 48V————XA042AA4

CONTROL CABLE

- HOME SWITCH————————————XA101AA2————————————B02 ┐ AA
- READ DATA————————————XA021AM4————————————B03 ┤ EXIT*
700KC PHASE B————————————XA011AT2————————————B05 ┤
+ ACCESS READY————————————XA031AW1————————————B07 ┤
————————————B08 ┤ WF391
————————————B12 ┤ X-A1A2
- READ CLOCK————————————XA021AS4————————————D02 ┤
700KC PHASE A————————————XA011AS2————————————D05 ┤
- SECTOR PULSE————————————XA051AH4————————————D06 ┤
- 90 SECOND TIME DELAY RELAY————XA101AA6————————————D12 ┤
————————————D13 ┘

- WRITE SELECT ERROR————————XA011AF2————————————
- REFERENCE PULSE + REV————XA051AG4————————————

- FILE READY————————————XA052BK4————————————

CONTROL CABLE

- HOME SWITCH DRIVEN————————XA062AY4————————————B02 ┐ AC
+ ACCESS READY DRIVEN————————XA062AL4————————————B07 ┤ EXIT*
————————————B08 ┤
————————————B12 ┤
————————————D02 ┤ WF391
- SECTOR PULSE DRIVEN————————XA062AJ4————————————D06 ┤ X-A1A3
READ DATA DRIVEN————————XA062AK4————————————D12 ┤
————————————D13 ┘

NON DRIVEN
AM ┐ B04
ENTR* B09
WL B10
B13
WF391 D04
X-A1A2 D07
D09
D10
D11

XA021 - CPU READ SELECT————————AB2
XA031 - ACCESS GO————————AB5

XA012 - HEAD 1 SELECT + HEAD 0————AB7
          + CE INTERLOCK————AB6
XA012   XA031   XA041
XA012 - WRITE DATA GATE————AB4
XA041 - 10 MIL STEP + 20 MIL————AB3
XA031 - CPU DIRECTION REV + FWD————AB1

XA012 - CPU WRITE GATE————AB9
XA013
       - CPU CLOCK GATE————AB8
XA011 XA012

DRIVEN
ADKB04
ENTR* B05
B09
KB10
WF391 KB13
X-A1A3 D04
KD07
KD09
KD10
KD11

XA062 D.F. WR. DATA TERMINATED————AD2
XA062 - CPU READ SELECT TERMINATED————AD3
XA062 - ACCESS GO TERMINATED————AD6

CPU INTERFACE		
E.C. HISTORY	MACH.13SD	
	FRAME	01
	IBM CORP. SDD	
DATE LAST EC	P.N. 2199526	
11-16-67 421047		

X A 0 6 1   000

XA031 — ACCESS GO TERMINATED————AE4

AE
N
2310▷D
D05 E L▷D06
X—A1B2

— ACCESS GO TERMINATED————XA061AD6*

AB
N
2310
B02▷
D   L
X—A1B2 D05*

AU
N
2310▷D
B09 E L▷D11   XA011 D.F. WRITE DATA TERMINATED————AU4
X—A1B2

D.F. WR. DATA TERMINATED————XA061AD2*

AN
N
2310
D04▷
D   L
X—A1B2 B09*

AG
N
2310▷D
B13 E L▷B08   XA021 — CPU READ SELECT TERMINATED————AG4
X—A1B2

— CPU READ SELECT TERMINATED————XA061AD3*

AD
N
2310
B12▷
D   L
X—A1B2 B13*

AJ
AR
2310
B10▷H U▷D09*   XA061 — SECTOR PULSE DRIVEN————AJ4
X—A1B2

— SECTOR PULSE————XA051AH4

AK
AR
2310
B03▷H U▷B04*   XA061 RAW READ DATA DRIVEN————AK4
X—A1B2

+ RAW READ DATA————XA021AY4

AL
AR
2310
B05▷H U D12*   XA061 + ACCESS READY DRIVEN————AL4
X—A1B2

+ ACCESS READY————XA031AM1

AY
AR
2310
B07▷H U▷D07*   XA061 — HOME SWITCH DRIVEN————AY4
X—A1B2

— HOME SWITCH————X101AA2

LOC. TYPE
X—A1B2 5739

XA061AD2	01X—A1A3D04		X—A1B2D09 AY4	X—A1A3B02
01X—A1A3B05	RESISTOR	AK4	X—A1A3D12	RESISTOR
RESISTOR	X—A1B2D02		RESISTOR	X—A1B2D07
X—A1B2D04	A56 RESISTOR		X—A1B2B04	
XA061AD3	X—A1B2D05	AL4	X—A1A3B07	
.01X—A1A3B09 AD6	RESISTOR		RESISTOR	
RESISTOR	X—A1B2B13		X—A1B2D02	
X—A1B2B12 AJ4	X—A1A3D06 ANE		RESISTOR	
XA061AD6	RESISTOR		X—A1B2B09	

2310—B LINE DRIVERS AND				
TERMINATORS				X
E.C. HISTORY		MACH.13SD		A
415411V	415433B			0
415352	415444	FRAME	01	6
415374A	415447	IBM CORP. SDD		2
415433	421032			
DATE	LAST EC			000
11—22—67	421047	P.N. 2199566		

A   B   C   D   E   F   G   H   J   K   L   M   N   P   Q   R   S   T   U   V   W   X   Y   Z

SYMBOLS
X= NO RULE SOCKET
E= CONFLICT
S= PORTIONS LEFT

LARGE CARD SOCKET ASSIGNMENTS & NOMENCLATURE. PIN SIDE SHOWN

TERMINAL STRIPS, SWITCHES, RELAYS. COILS
SOLENOIDS, AND DIODES

TERMINAL BARRIER TB

POINTS	1	2	3	3A	4	5
1	XA101	OPEN	XA101	XA101	XA101	OPEN
2	XA101	XA101	XA101	XA101	OPEN	OPEN
3	XA101	XA101	XA101	XA101	XA101	OPEN
4	XA101	XA101	XA101	XA101	XA101	OPEN
5	XA101	XA101	XA101	XA101	XA101	XA101
6	XA101	OPEN	XA101	XA101	XA101	XA101
7	-	XA101	XA101	XA101	XA101	XA101
8	-	XA101	XA101	XA101	XA101	XA101
9	-	-	-	-	XA101	-
10	-	-	-	-	XA101	-

SWITCH	NO.	LOCATION
CART. IN PLACE	1	XA101
CART. UNLOCKED	2	XA101
HOME	3	XA101
HEAD LOAD	4	XA101
CE HEAD SEL	5	XA012
CE STEP MODE	6	XA041
CE DIRECTION	7	XA031
CE STEP CONTROL	8	XA031
MOTOR START	REF	XA101
MOTOR STOP	REF	XA101

RELAY	NO.	COIL	CONTACTS 1	2	3
START	K1	XA101	XA101	OPEN	XA101
TIMER	K2	XA101	XA101	OPEN	-
DR MOTOR	K3	XA101	XA101	-	-
BLOWER MTR	K4	XA101	XA101	-	-

COIL/SOL	LOCATION
R/W HEAD #0	XA013
R/W HEAD #1	XA013
TACHOMETER	XA041
TRANSDUCER	XA051
VOICE COIL	XA042
HEAD LOAD	XA101
ODD DETENT	XA101
EVEN DETENT	XA101
CART. UNLOCK	XA101

DIODES		LOCATION
DIODE	D1	XA101
DIODE	D2	XA101
DIODE	CR1	XA101

TACHOMETER CONNECTORS
VIEW FROM FRONT OF MACHINE
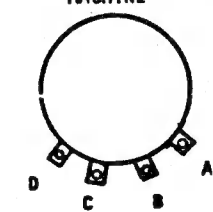
HEAD CABLE CONNECTIONS XA011

WIRE COLOR	OT	1B
GREY	E2 J12	E2 J13
RED	E2 J09	E2 G07
VIOLET	E2 G12	E2 G13
BLACK	D2 J08	E2 J08

48V CONNECTOR

VOLTAGE		WHERE FOUND
TB1-5	+48V	N2D02, G2D02, F2D02, L2D02, C4C04, J4B06
TB1-6	48V GND	N2D03, M3B07, B4A06, C4C06
	+35V REG	D2B09, E2B09, H2B09, J2B09, K2B09. L2B09
TB1-2	-3V	B06 SOCKETS B THRU M ROWS 2 AND 3, N3D06
TB1-4	DC GND	D08 SOCKETS A THRU N ROWS 2 AND 3
TB1-1	+3V	D03 SOCKETS B THRU M ROWS 2 AND 3
TB1-3	+6V	B11 SOCKETS B THRU M ROWS 2 AND 3 G4E06, H4A06, H4B06

CPU CABLE XA061
DRIVEN CPU CABLE XA061
LINE DRIVER & TERM. XA062
DATA SEPARATOR XA021
READ AMPLIFIER XA021
XA012 WRITE DRIVER & PREAMPLIFIER XA013
ACCESS AMPLIFIER XA041
ACCESS LOGIC XA031
WR SELECT SAFETY XA011 1.44 MC OSC. XA011
INTERLOCK XA051
TRANSDUCER XA051
VOLTAGE REGULATOR XA011
POWER TRANSISTORS XA042
POWER RESISTORS XA042

USED IN 2310-B REMOTE
BASE PLATE
USED IN SELF CONTAINED VERSION
TRANSDUCER CABLE
USED IN SELF CONTAINED VERSION
C.E. SWITCH & HEAD LOAD CABLE

DETAIL A

-0X48X -HEAD PICK
H4C06 (XA052BX2)

-0X48X -HEAD PICK
C4B04 (XA052BX2)

CONNECTED IN BOARD

HEAD LOAD SOL
TB2-7   TB2-8

D2
TB3-A-6
15Ω
TB3-A-2

-0X48X -HEAD HOLD
B4E06 (XA052BT2)
TB3-5   100Ω   TB3-6

-0X48X -ODD DETENT
J4C04 (XA031AX7)
ODD DETENT
TB2-3

+24X0X DETENT HOLD
J4A06 (XA031AZ3)

EVEN DETENT

-0X48X -EVEN DETENT
J4B04 (XA031AY7)
TB2-5   TB2-4

DC GROUND
H4E06 (XA011AV4)
TB2-2

HOME SW #3
N/O
HEAD LOAD SW #4
N/O

-HOME SWITCH -AA2
H4D04 (XA051)
+HEAD LOAD SW 4 -AA3
H4E04 (XA051)

-0X48X CART UNLOCK SOL
C4B06 (XA052BE4)

NOTE 4. 5.

ON OR HEADS LOADED
CART UNLOCK
+48V

TB3-4   220Ω   TB3-A-3
TB3-A-5   NOTE 6

CART UNLOCK
TB3-A-7
TB3-A-8   D1
TB3-A-4

+48V -AA4
TB3-3   C4C04 (XA042)
-DRIVE MOTOR ON -AA5
C4D04 (XA052)

N/C (MOMENTARY)
STOP
N/O (MAINT.)
TB3-7

START
N/O

TB3-8
CART IN PLACE SW #1
N/O   TB3-2

K1-1
START

START
K1
B   A

48V GROUND
B4A06 (XA042AC4)
TB3-A-1

TB3-1
CART LOCK SW #2
N/O

TB4-3   CR1   TB4-1
90 SEC DELAY
K2
B   A

DC GROUND
B4C04 (XA011)

K2-1

-90 SECOND TIME DELAY RELAY -AA6
C4A06 (XA051) (XA061)

AC CABLE REF
NOTE 5
HOT   TB4-7   L1   TB4-5
50UH
GND
C1
.01 UF
NEUT
G3

TB4-8   R1   TB4-4   C2
100Ω   .01UF

K1-3
START

100Ω
.01 UF
NOTE 3
K3
4   2

BLUE

RED

THERMAL
DRIVE MOTOR
YELLOW

G1

TB4-6   4   3   BLUE

K4   ☆ 2   RED

THERMAL
BLOWER MOTOR
YELLOW

G2

AC BOX

T4-10   L2   TB4-9
50UH

NOTE 5
DC POWER CABLE REF

TB1
ELECTRONIC GATE (XA081)

+3V   1   M3A01
-3V   2   M3E01
+6V   3   M2A14
DC GND   4   M2E14
GND TO BASEPLATE
+48V   5   N2D02
NOTE 2   16UF
48V GND   6   N2D03

RED   TB5-5   A
ORANGE   TB5-6   B
.01µF
VIOLET   D
TB5-7
BLACK   C
TB5-8

TACH REF XA041

DATE   EC NUMBER   DATE
SEE INDEX CARD
AUG 67   421043
NOV 67   42047
15JUL68   421057
NOV 68   421063

NOTES:
1.
2. THIS JUMPER USED IN 1130 SYSTEM.
3. THIS RC NET NOT USED ON 115V 13 SD'S IN 1131
   AFTER JUNE 1968 AND ALL 13 SD'S AFTER SEPT 1968.
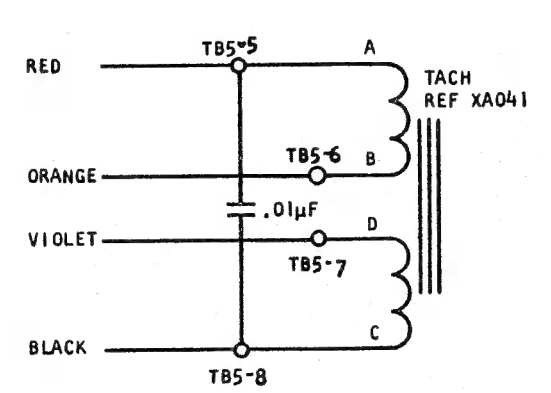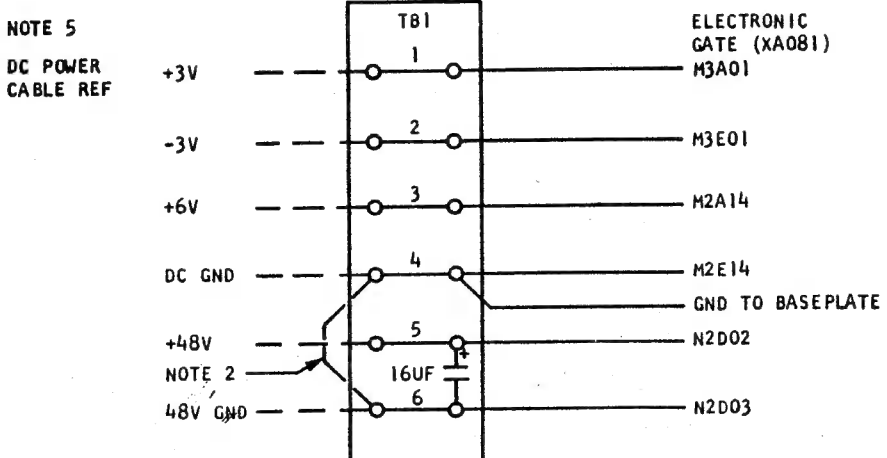
NOTES:
4. CIRCUIT IN DASHED BOX IS SHOWN FOR REFERENCE ONLY.
5. ACTUAL CIRCUIT SHOWN ON ZB101/UF112 IN
   SYSTEM LOGIC OR UF111 IF S-D-STOR IS IN
   2310B
6. USED WITH 2310B ONLY. WIRE BETWEEN TB3A-5
   AND TB4-3 TAPED OR REMOVED FOR OTHER SYSTEMS

BLOCK DIAGRAM

DATE	EC NUMBER	DATE	EC NUMBER	BLOCK DIAGRAM		
JAN 68	421047					
				DATE	JAN 68	P/N 2199580
						TYPE 13SD
				IBM		XA110

Column markers: 2 3 4 5 6 7

Row markers: A B C D E

Left-side input signals:
- -ACCESS GO — XA061
- -HOME SW — XA101 / XA061
- +HD.LD.SW — XA101
- CPU DIR.-FWD,+REV — XA061
- -3V — 180Ω — E2B03 — N/C(REV) — CE DIRECTION
- -DR MTR ON — XA101
- -90 SEC TIME DELAY — XA101 / XA061
- -10 MIL +20 MIL STEP — XA061
- +CE INTERLOCK — XA061
- CPU CLOCK GATE — XA061
- HEAD SEL — -HEAD 1,+HEAD 0 — XA061
- CPU WR GATE(WR OSC PHASE A & B) — XA061
- WR DATA GATE — XA061

Right-side output signals:
- +48V
- +48V
- -WR SEL ERROR — XA061
- -READ DATA — XA061
- -READ CLOCK — XA061
- RAW READ DATA — XA062
- CE TEST POINT

Labeled blocks and components (selected):
CARTRIDGE UNLOCK SOL, +48, REV, TACH BAL, TACH, TACH AMP, EM FOL, -3 LOSS DET., INTEGRATOR CHARGE, 2.6 MS, GO LATCH, 750 Ω, FWD, -FILE READY, XA061, HEAD HOLD 100Ω, HEAD LOAD SOL, +48, 15 Ω, 300 Ω, +6, 10K, +6, VARIABLE 10 NS, +ACCESS READY, XA061, INTGRTR RESET, LEVEL DET, DET TRIGGER, DETENT SQUELCH, DETENT DRIVERS, ODD DETENT, EVEN DETENT, N2D05, +48V, 150Ω, +3, 62Ω

VOICE COIL, ACCESS FORWARD, M2J13, M2G10, M2G02, M2B05, 257, 510 Ω, -3, N2 B05, N2 B06, 220Ω, .1 UF, .1 UF, 62Ω, CK, 042

SECTOR TRANSDUCER, LIN AMP & DETECTOR, 165 US, -SECTOR PULSE — XA061, -REF.PULSE, 890 US, INTEGRATOR, RAMP GEN, LEVEL DET, LEVEL SET, <70%, LATCH, NOTE:-ONLY WHEN SPEED REDUCED BELOW 70% OF RPM, DATA SEPARATOR, 400 NS, VARIABLE 600 NS, 400 NS

HEAD 0, +35, 825Ω, WR CUR DET, WRITE ERROR, LATCH, 2 HDS SEL DETECTOR, HEAD 1, ON DLY 50 US, SELECT MATRIX, R/W HD 0, CPU READ SEL — XA061, DIFF.LIM. DETECTOR

CE.HD.SEL.SW. N/O(HD 0), WR TRIGGER, HEAD DRIVERS, NOT WR CLAMP, CLAMP +35V, +35, 1.44 MHZ OSC, 720 KHZ FREQ DIVIDER, 720 KHZ — XA061 — PHASE A, 720 KHZ — XA061 — PHASE B, R/W HD 1

RELAY CONT, CE CONTROL, SINGLE STEP, 10K, +6, CE MODE SW 10/20 MIL, 430Ω, +6, 10K

E2J12, E2J13, E2G12, E2G13, AR DF, 4300Ω